

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: : BOX PATENT APPLICATION  
Alain FORESTIERE et al. : Group Art Unit: Unassigned  
Serial No.: Unassigned : Examiner: Unassigned  
Filed: May 25, 2001

For: MATERIALS COMPRISING ORGANIC GROUPS CONTAINING  
SULPHUR AND PHOSPHOROUS BONDED TO A MINERAL OXIDE VIA  
OXYGEN ATOMS

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please cancel claims 3-11 without prejudice or disclaimer.

Please add the following claims:

--12. Materials according to claim 1, in which M and M' represent an element from groups IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA, the lanthanides or the actinides of the periodic table.

13. Materials according to claim 1, in which M and M' are selected from elements from the group consisting of titanium, zirconium, iron, aluminium, silicon and tin.

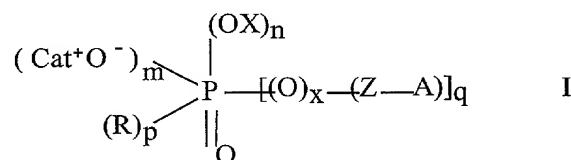
14. Materials according to claim 1, in which M and M' are selected from elements from the group consisting of by titanium, zirconium and aluminium.

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15. Materials according to claim 1, in which the organic sulphur-containing group is selected from thiol groups and derivatives thereof or from acid sulphonic groups and derivatives thereof.

16. Materials according to claim 14, in which the organic sulphur-containing group is selected from thiol groups and derivatives thereof or from acid sulphonic groups and derivatives thereof.

17. A process for preparing a material according to claim 1, in which at least one halogenated derivative of the formula  $M(\text{Hal})_z$  or at least one alkoxyated derivative of the formula  $M(\text{OR}')_z$ , wherein  $z$  is equal to the valency of the element  $M$ ,  $\text{Hal}$  is a halogen atom,  $\text{R}'$  is a hydrocarbon group, or at least one compound of element  $M$  selected from the group consisting of carboxylates, sulphates, nitrates, hydroxides and oxychlorides is brought into contact with at least one solvent solution of at least one phosphorous-containing compound of formula I



wherein the sum  $m+n+p+q$  is equal to 3,  $m=0, 1$  or  $2$ ,  $q=0, 1$  or  $2$ ,  $x=0$  or  $1$ ,  $p=0, 1$  or  $2$ ,  $\text{R}$  is a hydrocarbon group,  $\text{X}$  is a hydrocarbon group or a group of the formula  $\text{SiR}''_3$  where  $\text{R}''$  is a hydrocarbon group,  $\text{Z}$  is a hydrocarbon group optionally comprising heteroatoms,  $\text{Cat}^+$  is a monovalent cation and  $\text{A}$  is a sulphur-containing group or a reactive group that can be transformed into a sulphur-containing group.

18. A process according to claim 17, in which an alkoxyated derivative of the formula  $M(\text{OR}')_z$ , wherein  $\text{R}'$  is an alkyl group containing 1 to 12 carbon atoms, is brought into contact with a solution in a solvent of a phosphorous-containing compound of formula I wherein  $\text{Cat}^+$  is a proton  $\text{H}^+$ ,  $\text{R}$  is an alkyl group containing 1 to 18 carbon atoms or an aryl group containing 6 to

18 carbon atoms or an alkyl-aryl group containing 7 to 24 carbon atoms, X is a group of the formula  $\text{SiR}''_3$ , wherein  $\text{R}''$  is a hydrocarbon group, Z is a saturated or unsaturated bivalent alkyl group containing 1 to 18 carbon atoms or a bivalent aryl group containing 6 to 18 carbon atoms or a bivalent alkyl-aryl or aryl-alkyl group containing 7 to 24 carbon atoms and A is a sulphur-containing group selected from thiol groups and their derivatives and sulphonic acid groups and their derivatives.

19. A process according to claim 17, in which the phosphorous-containing compound of formula I is a compound in which  $m=2$ ,  $q=1$  and  $n=p=\text{zero}$ .

20. A process according to claim 17, in which the phosphorous-containing compound of formula I is a compound in which  $n=2$ ,  $q=1$  and  $m=p=\text{zero}$ .

21. A process according to claim 17, in which the phosphorous-containing compound of formula I is a compound in which Z is a saturated bivalent alkyl compound containing 1 to 6 carbon atoms.

22. A process according to claim 17, in which the solvent for the phosphorous-containing compound of formula I, is tetrahydrofuran, dimethylsulphoxide, dichloromethane or water.

23. A process according to claim 18, wherein  $\text{R}'$  is an alkyl group containing 1-6 carbon atoms.

24. A process according to claim 21, wherein Z is a polymethylene group.

25. A process according to claim 18, in which the phosphorous-containing compound of formula I is a compound in which  $m=2$ ,  $q=1$  and  $n=p=\text{zero}$ .

26. A process according to claim 18, in which the phosphorous-containing compound of formula I is a compound in which  $n=2$ ,  $q=1$  and  $m=p=\text{zero}$ .

27. Materials according to claim 2, wherein M and M' represent Ti.
28. Materials produced according to the process of claim 17.
29. Materials produced according to the process of claim 18.
30. Materials produced according to the process of claim 19.
31. Materials produced according to the process of claim 20.
32. Materials produced according to the process of claim 21.
33. Materials produced according to the process of claim 22.
34. Materials according to claim 28, wherein M and M' represent Ti. --

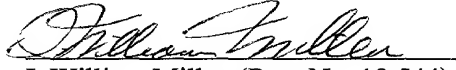
**REMARKS**

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The changes are of an editorial nature and are not intended to narrow the scope of the claims or to comply with any statute relating to patentability. Also, multiply dependent claims are removed to facilitate examination and reduce fees. Conversely, there are added product by process claims 28-34 and claim 27 drawn to a species wherein both M and M' represent Ti. The attached page is captioned "**Version With Markings To Show Changes Made**".

Attorney Docket No.: PET-1936

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

  
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Date: May 25, 2001  
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS**

Claims 3-11 have been canceled, therefore no marked up version is necessary.

Claims 12-34 have been added.